WE CLAIM:

- 1. A fluorescence detector comprising:
 - a) a light source for exciting specific fluorophores located on a biopolymer array;
 - b) means for directing said light source into said waveguide support to cause total internal fluorescence in said waveguide support; and
 - c) a charge couple device for detecting emission spectra.
- 2. The fluorescence detector of claim 12, wherein said light source generates a laser beam.
- 3. The fluorescence detector of claim 12, wherein said light source generates multiple spectrally distinct laser beams.
- 4. The fluorescence detector of claim 12, wherein said light source is comprised of four spectrally distinct laser beams.
- 5. The fluorescence detector of claim 12, further comprising a transparent hexahedron, wherein said transparent hexahedron revolves around an axis perpendicular to said light beam for placing said light source into said waveguide support.
- 6. The fluorescence detector of claim-12, further comprising an optical wedge, wherein said optical wedge revolves around an axis approximating said light beam for placing said light source into said waveguide support.
- 7. The fluorescence detector of claim 12, further comprising a cylindrical lens for focusing said light beam into a shape smalled than an edge of said waveguide, wherein said light beam is entering said waveguide at said edge.
- 8. The fluorescence detector of claim 12, further comprising a mirror for directing said light beam into said waveguide support.
- 9. The fluorescence detector of claim 12, further comprising a diffraction grating for directing said light beam into said waveguide support.

- 10. The fluorescence detector of claim-12, further comprising an optical prism for directing said light beam into said waveguide support.
- 11. The fluorescence detector of claim 12, further comprising a transparent liquid placed between said waveguide support and said optical prism, wherein said transparent liquid possesses a refractive index about equal to the refractive indices possessed by said waveguide support and said optical prism.
- 12. The fluorescence detector of claim 12, wherein said waveguide support has a polished edge in which said light beam enters said waveguide support to illuminate said waveguide support broadly.
- 13. The fluorescence detector of claim\12, wherein said waveguide support has a frosted edge in which said light beam enters said waveguide support to illuminate said waveguide support broadly.
- 14. The fluorescence detector of claim 12, further comprising bandpass filters for separating emission spectra.
- 15. The fluorescence detector of claim 12, further comprising a personal computer to collect and analyze emission spectra.

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- 16. A method for detecting and analyzing a specific nucleic acid sequence comprising:
- a) inserting a waveguide support into a fluoresecence detector, said waveguide support being spatially situated between a light source and a charge couple device in said fluorescence detector, wherein said waveguide support possesses an array of affixed oligonucleotides, wherein at least one said oligonucleotide possesses one fluorescent nucleotide;
- b) exciting said fluorescent nucleotide by directing said light source to said waveguide support;
- c) detecting emission from said fluorescent nucleotide with said charge couple device; and
 - d) analyzing said emission on a personal computer.

- A method of analyzing the sequence of a polynucleotide of interest, comprising the 17. steps of:
- a) attaching an array of oligonucleotide primers having known sequences to a solid support at known locations, wherein said solid support may act as a waveguide;
- b) hybridizing the polynucleotide of interest to the array of oligonucleotide primers to generate double stranded oligonucleotides;
- c) subjecting the double stranded oligonucleotides to a sequence specific single base polymerization reaction to extend the annealed primers by the addition of a fluorescently – labelled terminating nucleotide, wherein said primers may be extended by any fluorescently – labelled terminating nucleotide which is complimentary to the polynucleotide of interest;
 - d) removing the polynucleotide of interest from the array of oligonucleotide primers;
- e) inserting said support into a fluoresecence detector, wherein said support is spatially situated between a light source and a charge couple device in said fluorescence detector, wherein said light source is able to specifically excite each fluorescently-labelled nucleotide sequentially;
 - f) exciting said fluorescent nucleotide by directing said light source into said support;
- g) detecting emission from said fluorescent nucleotide with said charge couple device; and
 - h) analyzing said emission on a personal computer.

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